JPRS 82579

4 January 1983

West Europe Report

SCIENCE AND TECHNOLOGY

No. 132

FBIS FOREIGN BROADCAST INFORMATION SERVICE

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50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. JPRS 82579	2.	3. Recipient's Accession No.

4. Title and Subtitle

WEST EUROPE REPORT: SCIENCE AND TECHNOLOGY, No. 132

5. Report Date 4 January 1983

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address

Joint Publications Research Service
1000 North Glebe Road
Arlington, Virginia 22201

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.

(C)

(G)

12. Sponsoring Organization Name and Address

As above

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This report contains information on national-level science policies, technology strategies, and research and development programs in West European science and technology in general and specifically in civil technology, with particular attention to transportation, energy, chemical manufacturing, industrial automation and technology transfer. The report will focus primarily on France and the Federal Republic of Germany, but will also cover important developments in Italy, the Netherlands, Sweden and other West European countries.

17. Document Analysis a. Descriptors

WEST EUROPE
Science and Technology
Chemistry
Energy
Industrial Technology
Science Policy
Transportation
Biotechnology
Electronics

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group 01, 07A, 10, 13B, 17

18. Availability Statement:	19. Security Class (This Report)	21. No. of Pages
Unlimited Availability Sold by NTIS Springfield, Virginia 22161	UNCLASSIFIED	34
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI-Z39.18)

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

JPRS 82579

4 January 1983

WEST EUROPE REPORT

SCIENCE AND TECHNOLOGY

No. 132

CONTENTS

BIOTECHNOLOGY

NETHERLANDS CLAIMS FIRST COMMERCIAL RECOMBINANT-DNA VACCINE

Huizen AARDE & KOSMOS in Dutch Sep/Oct 82 pp 486-487

[Article by John Beek]

> [Text] The first commercial vaccine produced by means of recombinant-DNA is on the market. It is not the already much discussed interferon or human insulin but a vaccine which fights dysentery in calves and farrows. Nor does the vaccine come from California, the 'Mecca' of recombinant-DNA, but from the Netherlands. The producer, Intervet, at Boxmeer, thus has become the first producer in the world.

Each year, approximately 10 percent of all newly born calves and farrows die from diarrhea caused by dysentery. That costs cattle-breeders lots of money. It is true that there already was a vaccine against this form of dysentery, but it was made from cells of sick animals, and that method of production is extremely laborious, it works but slowly and, therefore, provides a costly vaccine. With the recombinant-DNA technique, the production goes much faster.

Intestinal Bacteria Cause of Evil

The dysentery which is caused by a certain strain of the intestinal bacterium Escherichia coli, is in itself not the cause of death. The diarrhea which follows as a reaction to it, however, results in such a heavy loss of water from the animal that it dies from dehydration. The bacteria secrete a poison which resembles cholera, and which leads to the diarrhea.

In the Netherlands as well as in the Californian enterprise of Cetus Inc., the genetic part of the poison was examined. Most bacterial poisons are coded through a segment of DNA which does not form part of the bacterial chromosome, or which only does so in extremely exceptional cases. That segment of DNA is called a plasmid (which we discussed, among other things, in AARDE & KOSMOS No. 10, 1980). In the special plasmid of this type of E. coli, the codes were found for two proteins, which, for the sake of convenience, were called protein A and protein B. These two proteins are together responsible for the deaths among the animals and the losses of millions of guilders to cattle breeders. Protein A enables the bacterium

to adhere to the outer cells of the intestinal wall and, thus, to form a colony. Then, the separation of protein B starts. That protein sees to it that the intestinal cells increase their level of cyclic AMP. Many hormones do the same thing in order to make the cell more active. Protein B, however, speeds up the activity of the cell much too much, with the result of diarrhea and an often fatal dehydration. The proteins A and B are, indeed, also referred to as adhesion factors. In our country, research had already been performed at an earlier stage by the National Institute for Public Health at Bilthoven on the significance of adhesion factors in bacteria which generate disease. Information on the plasmid was, indeed, also already available in our country, thanks to research done at the Free University in Amsterdam.

Reconstruction of Bacterium

After the biotechnologists had located the genes concerned in the plasmid, they began the recombining process. They left the indications for protein A intact. The gene for protein B, however, was replaced by an entirely innocent code from a laboratory strain of E.coli. The recombined bacterium is thus still capable of forming a colony but can no longer disturb the metabolism of the cells of the intestinal wall. The formation of colonies gives rise to an anti-body reaction in the carrier of the bacterium, causing the young animal to become immune to the really dangerous types of bacteria. The vaccine now consists of the 'new' adhesion factors, which are made in the laboratory by means of the recombined bacteria. That vaccine is injected into the mother animals and, via the mother's milk, ends up in the young animals, so that the said anti-body reaction takes place in them.

Americans in Favor

The E. coli bacterium comprises a large number of types; also in human intestines, various types occur, but they differ from the diarrhea bacteria in calves and farrows. The diarrhea bacterium is not dangerous to man, and that has furthered the research into, and the making of, the vaccine. No extra safety measures needed to be taken beyond the strict regulations which normally already are in effect and which also apply in the laboratory of Intervet.

As already pointed out, Intervet has been faster than Cetus. At Cetus, they are busy with exactly the same thing and even also have contacts with the Free University in Amsterdam. The vaccine from Cetus appears, from laboratory tests, to be working well. However, the U.S. authorities will await the outcome of field tests on an estimated 20,000 animals before allowing the vaccine to be marketed. At Cetus, it is expected that that permission will be forthcoming soon.

7262
CSO: 3698/84

ELECTRONICS

TECHNOLOGY, SALES KNOW-HOW LURE NIXDORF TO AMERICAN MARKET

Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German
10 Nov 82 p 5

/Article: "America--a Challenge for the German Computer Industry"/

/Text/ Frankfurt, November, 1982. Through organization-oriented application systems, the German computer industry has achieved a respectable position in international development competition. Its strength lies in its significantly greater use of "machine intelligence." Design emphasis on interactive processing is an example. However, the homeland for computer progress in technology, system control and marketing is still America. Therefore, Nixdorf Computer AG is focusing on objectives other than a high market share in its involvement in the American market.

Klaus Luft, vice chairman of the board in Paderborn stresses in this connection three goals: His company will gain access to American know-how on location. The company will test itself against the major competitors in the United States on their own turf to better arm itself for the growing competition in Europe. And it will profit with the others due to the market size.

Since founding the first American subsidiary 10 years ago, the company has received important stimuli for new products and systems from the United States on many occasions, for instance the basic ideas for the successful 8870 computer family and the acquisition of the model-600 computer from Entrex. Also, the EDOS operating system developed in America has proven to be a good start. With it Nixdorf has been able to place in the worldwide PCM (Plug Compatible Manufacturer, or IBM plug-compatible systems) market.

European Solutions for America

The very important technology-transfer activity is in the main pushed along two tracks--inside one's own company and through cooperative arrangements. The company's own research and development centers are not only keeping up with innovations in the American market but are also transporting hardware and software solutions from Europe to America. This takes place for systems of all types in Burlington, MA, the seat of the Nixdorf Computer Corporation; whereas, the Nixdorf Computer Software Company in Richmond, VA concentrates

on the development of PCM software. The Technology Center just founded in 1981 in San Mateo in California's Silicon Valley concerns itself with the early recognition of new developments in semiconductor, memory and peripheral components and also with tracking performance and cost developments.

The just as ambitious second objective involves joint efforts with mostly small innvoative teams of domestic hardware and software vendors from which emanate again and again new impulses for further developments. Often, such partnerships result in a Nixdorf acquisition, as in the case of the Computer Software Company in Richmond. The old hands at this software house have been involved with developing compatible systems since 1973. Also in America, further innvoations--particularly in application systems--have their origins in close cooperative work with computer users.

The company is approaching noticeably closer to the two market-oriented main goals. In the competition with American computer manufacturers, Claus Luft sees it as an important advantage that Nixdorf is producing in their country. The main problems do not, however, arise out of the market struggle with the most formidable companies; they result from the gigantic market dimensions. And in America it is much more difficult than in Germany to hold onto first-class sales personnel and to foster customer loyalty. The Paderborn company rests not only on its attractive products but in equal measure on its persistence.

In America it can also bring into play its several years of experience with network and interactive systems. Whereas, in our country, interactive processing has occupied top spot for several years, applications in America are still featuring central batch processing and batch transmission. Only recently have the Americans begun to be serious about providing greater computer power for the worker at his work station. This has pulled into the foreground the importance of already mature network concepts, know-how in local task areas and, by no means least, the solution of ergonomic problems. These are Nixdorf strong points.

Attention focused on the great importance of continuous market presence and continuous product lines shows that in America about 5,000 new companies have entered the data processing market during the last 4 years. Further, about 1,250 new entries can be expected each year, and during the same period an equal number of vendors will probably disappear from the market.

No Dead-End Streets for Users

In order to win loyal employees and customers, Nixdorf has made sales follow-through a solid component of its strategy. Also, more and more vertical markets will be opened up through expansion of application software and through service and pricing policy. The company competes with American computer companies in their own country also by pushing systems which do not lead users down dead-end streets but, instead, offer continuous problem solutions--systems which are upward compatible with other systems or can be upgraded in the manufacturer's own line.

The array of products offered is smaller in this market than in Germany. For example, Nixdorf is still not selling systems for banking and commerce, and several other models made their debut in America much later than in Germany.

Computer systems of the 600 series--known in Germany as the 8850--have been marketed since 1976. In this product area, the company is the market leader in the United States. The 8870 computer family is sold through the company's own distribution network and also by factory representatives, and the success of this effort is due in no small part to the standard software system COMET and other ready programs.

Also, since taking over the software house in Richmond, Nixdorf has become one of the leading vendors of IBM-compatible system programs. The company can offer on its own total system solutions. Different than in Germany, the company is still little known as a network system specialist in America. The network-oriented computer system 8860 has only been offered since 1981. The pilot customer is the National Education Association--with 1.7 million members, the world's largest teachers' union--which is presently setting up a nationwide data network with this system. The union is also testing, as the world's first user, a new Nixdorf system, the 8810 personal computer, which was designed from the start as a network-oriented work station. This product will probably be released for distribution in 1983.

With the 8840 text system and the 8845 integrated office system, Nixdorf is moving into position to develop multifunctional office work stations in America also. A good year later than at home, the company began distributing the 8890 IBM-compatible computer in America in the spring of 1982. In the mainframe business, IBM naturally sets the standards in America also and has a market share of about 60 percent; of the 40 percent, 19 percent goes to the PCMs and the rest to others. In the midst of this contested market, the system 8890 had a favorable start. Within a few months 21 computers were installed in America, and 14 of these replaced IBM installations.

More and more, the problem for all PCMs is staying close behind the fast-changing market leader. Historically, the functions required for operating computers were realized in the system software. For some time, IBM has been putting more and more of these functions on the microships, that is building them into the hardware. And that goes much faster than new software releases. The time window available to competitors for inclusion of such new functions in their solutions is getting smaller and smaller. PCMs, however, whose business is not based on simply matching the market leaders functions but, rather, on functional enrichment starts with better odds. Among these is Nixdorf with the 8890 computer and the NIDOS/VSE operating system.

The company has today a capital of $45 million invested in America. Further opening the American market may, however, still require considerably greater investments.

With 1,800 employees--at Nixdorf Computer Corporation, Burlington, MA and Nixdorf Computer Software Company, Richmond, VA--the company is more strongly represented in America than in any other foreign market. In the 1981 fiscal year, sales of $160 million is expected to be achieved there. This result would make it the largest foreign computer vendor in this market, even ahead of the Japanese. The activities of more than 100 distribution and customer service offices are controlled through 5 regional centers. Today, this organization takes care of about 4,500 customers and more than 8,000 computer installations.

Service Network Still Lacking

On the other hand: Worldwide consumer sales will amount to more than DM 2 billion this year. But in the gigantic market between the American East and West coasts in the midst of the greatest international computer concerns even such a successful producer from Europe makes a small splash.

Nixdorf in covering the whole American market is still, however, far from achieving an adequate distribution and service network density because of market dimensions. Intensified involvement might however pay off. American factories and administrative offices spent about $77 million in 1982 for data processing. Market researchers project a billion dollars for 1987. Nixdorf sees good possibilities for getting its share.

9160
CSO: 3698/78

ERICSSON'S FOCI: NETWORKS, COMPATIBILITY LINKS, COMMUNICATIONS

Stockholm SVENSKA DAGBLADET in Swedish 16 Nov 82 p 23

/Article by Birgitta Gunnarsson: "'The Network' Is To Become Ericsson's Strength"/

/Text/ Ergonomics--both physical and system-related, as well as the capability of building bridges between different systems and between old and new systems--this represents our strength. These are our spearheads in the marketing area.

When Jan Rudberg, managing director of Ericsson Information Systems Sverige AB, weighs the prospects of his own company against giants such as IBM, Wang, Philips or Honeywell, the emphasis is largely on the ability to develop in direct interaction with the users.

Alfaskop, Ericsson's desktop terminal, for example, is regarded by many experts as the best in the world right now because of its ergonomic qualities both in the physical design and in the systems. Here it is the interests and demands of the Swedish users and trade unions which have spurred the development.

Large Companies

Ericsson is also far ahead as regards the ability to integrate systems, to interconnect the ways of communication in a company, and in this area has enjoyed the advantage of working in close cooperation with many large Swedish companies.

The latest example is the 200-million-kronor SAS order, which, roughly speaking, is intended to create ways of communication between all of SAS's computer units of different manufacture and at various places and levels. Another example is the development of a system for use by the hotel industry which was developed in cooperation with Sara and which connects the hotel's telephone switchboard with computerized reservations, billing etc. Terminal systems for banks is yet another area, and there Ericsson has already entered the tempting U.S. market.

What is of central importance in this case is ultimately that there are computer systems by various manufacturers which are difficult to interconnect and make compatible with one another. This is where Ericsson has found its area of strength, with communications units and systems which make such compatibility possible.

On Three Legs

And for the future, when it will be necessary to integrate all communication in a company, computer technology, office equipment and telecommunications, Ericsson regards itself as having an advantage since the company now dominates in all three areas. The company acquired the third "leg" with the purchase of Facit, whose printer, typewriters and calculators maintain a high standard and the bulk of whose sales is already abroad.

Bridge Builder

"Speaking of the future, there is a tendency to see it from overly long perspectives," Jan Rudberg says. The office of tomorrow will also contain today's products, and every piece of equipment bought for a company must pay for itself today."

"It is therefore important to see to it that old and new equipment and old and new programs are able to function together. This constitutes a limitation of the customer's ability to absorb all the new items. The most recent product should not necessarily be bought. It depends on what kind of equipment one already has."

"It is in that situation that we believe we fulfill the function of bridge-builder. We are not alone in concentrating on this, but we are holding our own very well."

Pressure on the United States

The United States, where half of the world market is, is almost a necessity for all companies.

"We are making a great effort there now, beginning with the Alfaskop terminals," says Lars Fossum, head of the Alfaskop division.

"Even if one succeeds in capturing only a marginal share of the market, it means a great deal in volume. Our goal in the United States is to reach five percent in 5 years."

Today Alfaskop has 12 percent of the market in Europe but wants to increase this share greatly over 3 years. This means more than is apparent, since the demand is simultaneously growing by 25-30 percent annually.

Big at Home

The domestic market is still the most important base, however. Being strong at home is a precondition for the ability of a company to have strength to compete in the world market. The strength of Alfaskop can be measured by the fact that it has captured half of the Nordic market.

For integrated communications systems Ericsson expects help from the parent company in the U.S. market, since the telecommunications monopoly there has now been broken up. Among other things, a gigantic market is expected for so-called

PBX exchanges, that is to say electronic company exchanges which make an integration of different communications systems possible in a company.

Right Segment

IBM is Ericsson's biggest competitor, as well as for most of the others. Nevertheless, Ericsson has a chance to compete. What is important, Jan Rudberg says, is only to find the right segment of the right market. In addition, the Ericsson concern has a lead in the interplay between telecommunications and computers. This is also true with respect to the U.S. telecommunications giant AT&T, which has just begun to force its way into the computer field.

The ability to see the whole, from the top of the company pyramid down to the desk of the individual employee, is also more well-developed in Swedish companies than in many parts of the world. Which in turn enabled Ericsson to develop and apply the integration concept in practice--a good basis to stand on when electronics begin to enter all levels of work in earnest.

/Photo caption. Photo not reproduced/ Ericsson recently won the bidding contest for the future computer system at SAS, an order worth 200 million kronor. With this system every SAS terminal will be able to communicate with all of SAS's various large computers of different manufacture. But the capability of the terminals to function independently will also be expanded as needed.

11949
CSO: 3698/76

SIEMENS DEVELOPS 120-CELL MASTERSLICE GATE ARRAY FOR CPU'S

Leinfelden-Echterdingen DIE COMPUTER ZEITUNG in German 8 Sep 82 p 18

/Unattributed Article/

/Text/ In the technology of the central units of computer systems, the trend towards ever greater packing density and processing power remains unbroken.

From 1972 on, there were four generations of semiconductor memories at intervals of just 2 to 3 years. The capacity of the memory modules here always rose by a factor of 4. Siemens, for example, is now using in its computers its 64 K bit components, which were developed and fabricated in-house. The next generation, too, the 256 K bit memory chips, are currently being developed in this enterprise.

Besides software-programmed microprocessors, logical components (gate arrays) are utilized in the Siemens central units. Their specific functions are always specified in the last production step in terms of hardware. A gate array chip with 36 logic cells has been developed and produced by this enterprise, according to the so-called master-slice method. In the 7500 series, it provides the highest processing power. A master-slice gate array with 120 logic cells is already under development. Its gate running times will be less that 0.5 nanoseconds.

The rapid interplay between memory registers and processing circuits is very important in a central unit. For this reason, Siemens has, for example, for the first time embedded a memory field (RAM) between the logic cells on its most recent master-slice chips. With only 3.5 nanoseconds access time, it is currently among the fastest semiconductor memories in the world.

Within the framework of VLSI development towards finer and finer structures, the required electrical charges are also becoming smaller and smaller. This increases the risk of "soft errors", that is erroneous switchings which occur only occasionally and are not reproducible. On the one hand, these are caused by minute electrical interferences and, on the other hand, by alpha-particles from the environment of the chips, but also by particles from the ever-present cosmic radiation.

In the working memory, these effects would lead to several errors per day. This problem is countered by two measures: The 64 K bit MOS chips are covered with a protective layer of polyimide, which absorbs the alpha radiation. This layer can be structured by photolithography and was developed in the Siemens Research Laboratory. However, the central units primarily work with a "correction refresh" in the working memory. At regular time intervals, the content of the working memory is read automatically, without participation by the central processor, is conducted through the error-correction equipment, and is again rewritten free of errors.

8348
CSO: 3698/111

'COAL AQUEOUS MIXTURES' PROGRAM PROPOSED IN NETHERLANDS

Amstelveen ENERGIE SPECTRUM in Dutch Sep 82 pp 202-203

> [Text] In close cooperation with Dutch industry and within the framework of the National Coal Research Program (NOK), the Dutch Energy Development Company (NEOM) will be preparing a development, demonstration and implementation program which should make it possible to start using coal liquid mixtures in the Netherlands. It is here a question of a technique, according to which a stable mixture of approximately 70 percent finely ground coal with a particle size of approximately 50 μm, 30 percent water and a maximum of 1 percent chemical additives, in the future, may replace fuel oil or natural gas as fuel for boilers and a few other combustion installations. According to current evaluations, these so-called CAM's (Coal Aqueous Mixtures), the calorific value of which is approximately 45 percent of that of fuel oil, may be introduced in the market at a price calculated on the basis of energy content, which is approximately 25 percent above the price of coal and approximately 25 percent below the price of fuel oil.

A number of disadvantages associated with the burning of coal (through grid combustion, pulverized coal combustion or fluidized-bed combustion) may be partly avoided when using CAM. CAM may be transported more easily than coal. The product is stored and transferred like oil and may be pumped, for example at room temperature. Dust inconvenience, dangers of fire and explosion, which may occur in the case of conventional coal handling and transport, are thus avoided. Also the high investments in infrastructure on the part of the user (covered storage space, coal grinding installations, etc.), partly associated with safety measures and environmental protection measures, are not necessary. Should leakages occur in the storage tank or in the tanker used in the transport, surface water pollution caused by CAM will occur to a far smaller extent than in the case of fuel oil.

By carrying out a physical purification process in the production of CAM, which may take place centrally, for example at the transfer of coal in a coal import port, it is possible to remove part of the ash-forming components beforehand. This is particularly interesting since the coal used in the production of CAM will have to be ground finely in any case. The purification will probably consist in an improved flotation process, whereby the pulverized coal undergoes a special treatment in water. A major disadvantage of this flotation, viz. the subsequent drying of the coal, does not pertain in the case of CAM.

By means of this purification process, the sulphur content may also be reduced through the elimination of 60-80 percent of the sulphur bound inorganically (especially pyrite). A CAM containing 0.6 percent of sulphur and 4 percent of ash may, in this way, be produced successfully, causing the ash disposal problem of the user to be reduced by approximately 70 percent. Normal coals mostly contain approximately 10-15 percent of ash, whereas a sulphur content of 1-1.5 percent occurs frequently.

The presence of water in the mixture causes a loss of 2-4 percent of the calorific value through the evaporation of water in the boiler; however, in pulverized coal combustion, this also costs approximately 1 percent. In the burning of CAM, less nitrogen oxides would, moreover, be released than in the case of a fuel oil or pulverized coal installation.

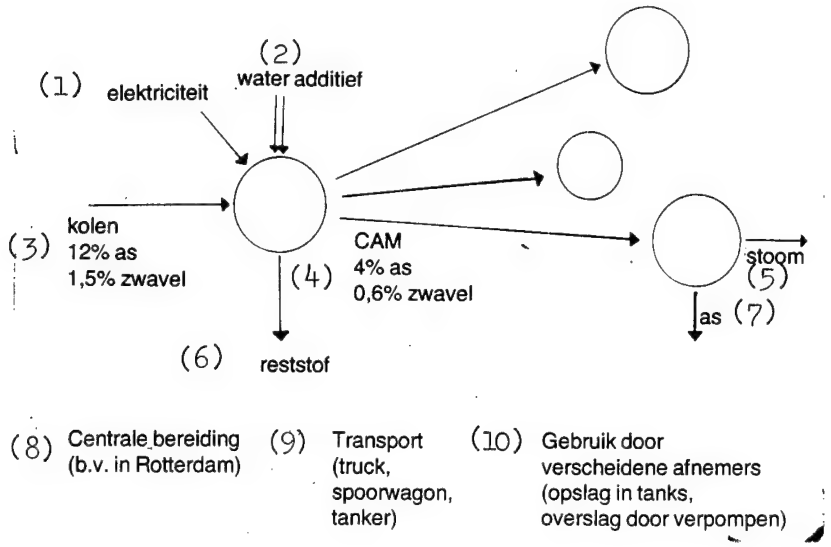
So far, the United States and Sweden have attached most importance to CAM technology. In the Netherlands, CAM could be used in existing, spaciously designed fuel oil boilers. Here, the burner component (including pumps, etc.) will probably then have to be replaced entirely, while also dust removal by means of a cloth filter is necessary. In addition, some adjustments will appear necessary in the boiler itself (soot blowers, bottom ash removal). The boiler capacity will decrease by 10 to 50 percent.

In view of the advantages of CAM compared to dry coal, such as the partial removal of ash and desulphurization, CAM might possibly bring about a new boiler development and come to form a new class of boiler fuels.

The group of users to whom CAM will offer the greatest advantages are the fairly small and medium-sized industries where the burden of the coal infrastructure is the heaviest. To power plants and the large industrial energy consumers, CAM will probably be far less attractive, except in the case of a few special cases.

Suggestions from all links in the coal chain, such as fuel dealers, CAM consumers, etc., who are interested in the initiative taken by NEOM, may be submitted to NEOM, attention: J. Smit, Engineer, P.O.Box 17,6130 AA Sittard, tel. 04490-14451.

Graphic Presentation of CAM Production and Use



Key:

1. Electricity.
2. Water additive.
3. Coal. 12 percent ash. 1.5 percent sulphur.
4. CAM. 4 percent ash. 0.6 percent sulphur.
5. Steam.
6. Residual substance.
7. Ash.
8. Central production (for example in Rotterdam.
9. Transport (truck, railway wagon, tanker).
10. Use on the part of different customers (storage in tanks, transfer by pumping).

7262
CSO: 3698/85

SCIENCE POLICY

FOUR NATIONAL INDUSTRIAL R&D PROGRAMS OUTLINED

Paris INDUSTRIES & TECHNIQUES in French 1 Sep 82 pp 12-13

/Article by A.L., C.G., J.-F. D. and I.G.: "Industrial Branches: The First Four Programs"/

> /Text/ More missions, more proposals...which underline our deficiencies for the nth time. Is the government finally going to back up its words with action?

"Productics": Objective of More Than 25 Percent A Year

Robotics are out. From now on, our present Minister of Research and Industry only wants to hear about "productics." So much for this neologism, which covers robot manufacture and part of mechanics. It marks the irruption into industry of processes and systems that were formerly confined to laboratories and to some sophisticated applications. Until now, in fact, automation of shops remained spotty and fragmentary. Today it requires a total design that combines its various sectors.

A Dynamic Regrouping

Thus defined, productics represent a market of over Fr 8 billion in France. In this market, advanced design machines (numerical control or programmable robots) represent sales of Fr 5,000 million; advanced robots, 300 million; industrial data processing, 1,200 million; computer-assisted design and manufacture (CFAO), 300 million and systems engineering, 1,200 million. This group, which employs more than 20,000 persons, constitutes a true industry. However, France is still woefully behind in automation. That is reflected, depending on the sector, by a loss of competitiveness of 5 to 30 percent compared to foreign firms. During the next 10 years, advanced technology will have to double the productivity of manufacturing industries. If automated equipment is increased at the rate of 25 percent a year, the annual productivity gains will go from 4 to 7 percent. This objective implies big efforts in productics. French robot manufacturers are penalized by their insufficient size and the small domestic market. Thus, the national champion Acma /Applied Mechanical Construction Shops/-Cribier produces one tenth as many robots as Unimation, the American and world leader. It is the same story in industrial data processing where our presence remains too small, especially

in computer-assisted design and computer-control of production units. However, France has a high level of research, particularly in languages and software. In addition, certain foreign-made robots, Swedish for example, are equipped with French components.

Considerable funding has already been committed by the Ministry of Research and Industry: 110 million to robot producers (through CODIS /Steering Committee for Development of Strategic Studies/), 100 million in 1982 for the Meca process, 2,500 million for the machine tool plan (1982-85), 20 million for automation (DAP /distributed array processor/ process).

In order to develop the robotics industry, the report presented in June 1982 by Maurice Petiteau to the Minister of Industry made several proposals, certain of which can be applied quickly, such as the idea of extending and regionalizing the financing procedures by a sort of leasing of productics tools. It is recommended that the activities of the Data Processing Agency and those of the Development for Automated Production be combined and that the nationalized firms play a training role and that research be launched on the economic and social consequences of automation.

Biotechnology: 600 Million in 3 Years

You take the same things and start over again, one would be tempted to say. The "Growth of Biotechnologies" program sent in July to J.-P. Chevenement calls on well-known protagonists: CNRS /National Center for Scientific Research/, INSERM /National Institute for Health and Medical Research/, INRA /National Institute for Agronomy Research/, IP /Pasteur Institute/, the major graduate schools and universities, the big companies (RP /Rhone-Poulenc/, Roussel, Uclaf, SNEA /Elf-Aqintaine National Oil Company/...). However, the experts who formulated this program deliberately emphasized the necessity of "creating a climate," of opening up the disciplines. It recommends "a coherent policy based on an industrial strategy proposed by pilot firms and oriented towards an ever broader dissemination to the industrial fabric systematically stimulated by public research." In the program being carried out, the mission counts 15 broad objectives and about 40 company projects in the sectors of medication, bioreagents, agronomy and agri-food. The amount of aid being requested from the government over a period of 3 years is Fr 600 million. It should correspond to a maximum of 50 percent of the investments. Three lines of research should be followed up right away. In the first place, knowledge, modification and preparation of the "actors" in the biotechnologies (cells, enzymes...); then, the study of biological reactions and their implementation; lastly, finalized research in definite industrial sectors. Precise tasks are assigned to the large public research organizations. Several measures will underlie this program: publication of techniques within industry, information, tax credits and subsidized loans, international cooperation and the creation, for the IAA /Agricultural and Food Industries/ of a single organization for advice and monitoring of ingredients and processes, inspired by the Food and Drug Administration.

Rigorous planning and periodical reevaluation of the activities should raise France's share to 10 percent of the world sales of the bio-industries by 1990.

Electronics: General Mobilization of R & D

A production level in 1981 of Fr 96 billion (three percent of the GDP), 318,000 employees, 200,000 indirect jobs: at first glance, the French "electronics industry" is not so bad off. In actual fact, the sector has a negative commercial balance. An extrapolation of the current tendency over the next 5 years indicates the possibility of considerable decay: the negative balance will be tripled to reach 19 billion in 1986 (1982 francs). There would probably be a decrease in the number of jobs, while the sector is in full expansion on the world level. In short, it was high time to react. The government program proposes to create 80,000 additional jobs and to raise the annual growth rate of the sector from three to nine percent. The financing of the program assumes an investment of Fr 140 billion (1982 francs) over 5 years.

In order "to bring France to the very front rank of innovative nations," and to assure the technological mastery of the industry, the research effort will be considerably increased. Research which "should be useful"...would you believe it? The American example is bearing fruit. Henceforth, precise short- and long-term results will be sought (prototypes, experimental services), and ones with the potential of considerable medium- or long-term markets. But, in order to motivate research and to make it more effective, it is the Japanese example that is going to be followed: the activities of the public laboratories are going to be closely coordinated. National projects will associate them with the industries. The government will use the weight of the nationalized sector (49 percent of the industry) to develop the strategic sectors. Agreements will be proposed to the firms in the private sector. Financial aid will be contingent upon specific promises on research /and/ development or upon the use of new technologies.

Mechanics Taken Seriously

The report of the "mechanics mission" written by Jean Persuy contains numerous proposals destined to "promote the image of our mechanics industry in the eyes of the public", and to consolidate its international position (sixth world rank with 10,000 firms). In fact, it is being called upon to play a basic role in the modernization of the production facilities.

Training has an important place in the measures suggested. In order to assure a better coordination of the various techniques, the mission proposes that the professional programs (CAP /Professional Aptitude Certificate/) be broadened, that complementary training in advanced techniques be integrated into them, that bivalent technician diplomas be created and that mechanical studies be beefed up in general engineering schools. In order to increase innovative efforts, the report emphasizes the necessity of reorienting a portion of the funds now devoted to new industries (aeronautics, automobile) back to "traditional" mechanics, doubling the financial means of the National Agency for the Promotion of Research by 1985 and increasing its premiums from 25 to 40 percent. The mechanical dossiers that are submitted to it should increase as a consequence.

The frantic rate of technological changes demands a better transfer of knowledge, particularly for the benefit of the PMI /Small and Medium Industries/. The experts envisage the creation of networks of technological counselors, liaison agents between the industries and the research laboratories whose field of competence, like that of the technical centers, should be broadened. Finally, they have indicated four directions for "strategic" research: problems of mechanisms and tribology, materials selection, automation and computer-assisted technical management. There is a lot on the table to get ourselves up to the level of our large international competitors.

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CSO: 3698/89

TAX BREAKS OFFERED FOR INDUSTRIAL RESEARCH

Paris L'USINE NOUVELLE in French 21 Oct 82 p 75

[Article by Pierre Virolleaud: "Research: Finally a Tax Break"]

> [Text] "Firms that increase their research expenditures will be able to deduct 25 percent of it from their taxes." This simple sentence from Pierre Mauroy at the ANVAR [National Agency for the Promotion of Research] Days in Nantes went straight to the hearts of the industrialists. As a result, innovation should be considerably spurred.

Of course, innovation is first of all a matter of interpretation. But the nerve center of the economic war should not be neglected because of that fact. That is why, while the dynamic atmosphere of the National Agency for the Promotion of Research Days had something to seduce even the most backward industrialists, the new measures in favor of research announced in Nantes at the end of last week by Pierre Mauroy and Jean-Pierre Chevenement should have completely convinced them.

"Firms that increase their research expenditures will be able to deduct them from their taxes." The simple sentence pronounced by the prime minister has the effect of a bomb.

In fact, for years industry has been asking for tax breaks for research similar to those that can exist in Germany, Sweden or Japan. Three years ago, a working commission led by Roger Fauroux, chief executive officer at Saint-Gobain, had concluded that such a procedure was necessary. But the Rue de Rivoli [Ministry of Finances] had always opposed the project.

The amendment, which will be presented to Parliament before the end of 1982, provides that 25 percent of the increase from one year to the next of all the expenses for research and development will be deductible from corporate income tax. The word development is understood in the broadest sense, since it extends to the building of a prototype or a pilot. As for the expenses taken into account in this context, they can be of several types:

--Reserves for amortizations other than real estate;

--Personnel expenditures (research personnel, technicians, ...);

--Operating expenses (evaluated as 50 percent of the overall personnel expenditures);

--Outside expenditures for research organizations or certified specialists;

--Expenses in connection with patent applications.

In order to avoid having the "big boys" in industrial research deplete the system to the detriment of the "little guys," this tax credit, equal to 25 percent of the increases of research expenditures, by volume, is limited to Fr 3 million, which is sufficiently high for only about 30 firms to be implicated by this limitation.

In order to avoid paying taxes, do research! A formula which should considerably spur the desired effort in industrial research which, as Jean-Pierre Chevenement recalled, should grow at the same rate of 17.8 percent per year in volume as that of nationalized firms.

The funding granted to ANVAR in 1983 should experience a similar increase. But, beyond the good financial news, the Nantes Days also demonstrated that the innovative spirit is beginning to win France over. Witness the success of the Technology Exchange where, for two days, 50 industrialists and scientists passed in review describing briefly their prototype and their technologies and advertised their needs for industrial or scientific partners, funds, marketing partnerships, and so forth.

Even more spectacular was the Capital Exchange. It was the first time that such an experiment, commonly practiced on the other side of the Atlantic, had been attempted in France. The rule of the game is simple: in the audience are about 60 financiers representing private investors, venture capital companies, stock brokers, regional development companies, banks. On stage, entrepreneurs who need specific funds to develop their business... and who aren't afraid to say so! Each of them explains his case and his needs in a brief quarter of an hour. Some questions are asked from the audience, then addresses are exchanged (after this first contact, negotiations will be pursued in private.)

Probably wanting to encourage the dynamism of such an operation, the organizers had found nothing better than the boxing ring in the vast sports complex where the conventioneers were meeting to have the financiers and the innovators meet. ANVAR does not lack punch!

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CSO: 3698/52

AI PURSUES ALL PLANNED PROJECTS DESPITE BAD ECONOMIC TIMES

Paris LES ECHOS in French 4 Nov 82 p 10

[Article by Arnaud Rodier: "Airbus Industrie Chooses To Take Risks in a Depressed Market"]

[Text] Three heartbreaks, one on top of another, for Airbus Industrie. Thai Airways selects Boeing, when the company had promised to buy two A 300-600; MBB (Messerschmitt Boelkow Blohm), partner of the European consortium in the FRG, announces 2,000 layoffs. And Alitalia, so sought after, yesterday took options on Douglas DC-9's... A sad birthday for Airbus, which just celebrated 10 years of existence!

Worldwide recession, erratic airline rate policies, excessively high interest rates--all airplane manufacturers are bowing low. Yet Airbus is maintaining its wager. At the risk of being accused of carrying out a strategy against the current. But that is perhaps the best way to catch Boeing off balance.

"For 2 years, we have withstood the crisis better than our competitors," Bernard Lathiere, managing director of Airbus Industrie, said yesterday during a luncheon of the Aeronautique public relations group. He expects to settle at once the rumored problem of setbacks for the consortium. Thus, Thai [Airways] is not lost. The company does not yet have authorization from its government, which was in the bag for Airbus, so that "the matter remains open." Likewise, the difficulties of MBB are not so much a result of poor Airbus sales as of matters of internal reorganization specific to the German firm. Having said that, the middle-term future of the European consortium has not yet been laid out.

Toulouse is currently assembling 4.8 planes per month and will soon go to 5, then 6, planes. To that extent, the initial program is being respected. But after that, things may change. "We were planning to go to eight units if the market demanded it, but it is not making any move in that direction," admits Bernard Lathiere. Airbus Industrie is, therefore, constrained to let up on the gas. Which does not mean that it plans to go into reverse. On the contrary. And that is the basis of its wager.

The development of the A-320 is following its course. It will be put in service "as quickly as possible," affirms Lathiere, who assures us that

they have "a real lead over the competition." [What about] the motor for this small 150-place plane that should fly in 1987 or 1988? It will be the best possible. "People will not put up $2 billion if the plane does not have an obvious advantage over the DC-9 80 or the 727-300," emphasizes the Airbus boss. At the moment, three groups of motor manufacturers are in the running: Snecma [National Company for Airplane Motor Research and Manufacture] with General Electric, Pratt and Whitney, Rolls Royce and the Japanese. The latter are carrying out serious conversations with Pratt and Whitney. Will they bring out a motor in time, which would imply a decision for launching as early as the beginning of next year? "I have the feeling that the situation is going to thaw," says Bernard Lathiere. If not, there will always be the alternative of a derivative of the CFM 56...

In the race for the plane of the future, the A-320 is, of course, attracting attention. But it is not monopolizing all of the efforts of Airbus Industrie. The consortium does not intend to abandon its other projects--TA-11, TA-12 and TA-9. "The strategy of Airbus is of course to launch all three, but we do not want to make the same mistake as Boeing, which brought out three planes at the same time," insists Lathiere.

By broadening cooperation on the A-320 to Canada (De Havilland), to the Netherlands (Fokker) and to Italy (Aeritalia), Airbus expects to preserve precisely the industrial and financial potential of its traditional partners. A way of preserving the greatest flexibility possible to respond to the demands of the market. But which also implies problems in the "internal mixture" to the extent that all of the partners do not necessarily have the same ideas about the development of the consortium! However, Airbus is not worrying about that. At the moment, a taste for risk seems to be shared equally by all.

Although it is expecting a stagnation of the market in 1983 and 1984, Airbus thinks it still has orders that will allow it to hold on without problems for at least 2 or 3 years. And the consortium, by maintaining its pace, is taking out a kind of insurance for the future: the possibility of keeping up when the market gets better.

Because if the resumption of airline traffic expected by the specialists materializes, only the manufacturers who have believed in a relaunching will be able to take advantage of it. Today, the confidence of Airbus and its counter-current policies are probably costing it a lot, if only in finance charges, but tomorrow they could pay off. And all the more so because the consortium is not suffering too much from the exhausted American market, in which it is poorly placed, while other countries where the European manufacturer is well placed have better prospects.

Bernard Lathiere's wager is obviously risky but it is far from being lost. And the more Airbus moves away from Boeing, the more it appears as a formidable competitor. And one without any complexes.

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CSO: 3698/67

HEAD OF AIRBUS INDUSTRIE INTERVIEWED ON SLOWING MOMENTUM; COMPETITION

Paris L'EXPANSION in French 12-25 Nov 82 pp 92-97

[Interview with Bernar Lathiere, managing director of Airbus Industrie, by Herve Jannic: "Mr Airbus: 'We Resist Better Than Boeing'"; date and place not specified]

> [Text] Airlines are weak and drained. Competition is becoming "hyperfierce." Bernard Lathiere counterattacks.

There is an Airbus myth. After the half-success of Caravelle, which just managed to balance its accounts, and the tragedy of Concorde, for which French and British taxpayers have not finished paying, has not France finally demonstrated that it could mass-produce a profitable aircraft?

We have no real reason to shout victory; first, because Airbus Industrie, although incorporated under French laws and managed by a Frenchman, is in fact a European enterprise (France has only a 37.9 percent interest in it); then because--no matter how commercially successful a truly competitive aircraft is--the huge amounts invested and still to be invested in that program will not be recovered so soon.

It is true that Airbus has taken a substantial share of airline orders at the expense of a competitor which is just not anybody: Boeing.

But the air transport industry is now in trouble. Almost all airlines are operating in the red and cutting back their investments. The first victims of austerity were McDonnell-Douglas, Lockheed, Boeing and, to a lesser extent, Airbus Industrie. The European champion must therefore face the world crisis and the counterattack of its powerful opponent, Boeing, which no one expected to stand helpless and watch. This unequal duel may cost Airbus a lot and, according to some experts, it has already been burnt.

Is that a sign of a forthcoming defeat, or is it just a temporary setback? The managing director of Airbus Industrie, Bernard Lathiere, has his own view on the question. Here they are.

[Question] Lagging sales, decreasing workloads, layoffs, financial drain: alarming rumors concerning Airbus have been circulating for several months. Thai Airways' decision, early in October, to cancel its order for two Airbus and order the new Boeing 767 instead is an added cause for pessimism. Is the Airbus really in trouble?

[Answer] Some time ago, the Airbus program was said to be working very well; now, it is said to be in trouble. Actually, Airbus does not deserve such excessive honor nor such indignity. The Thai question should not be given excessive importance. Assuming the order is lost--and I do not think it is--it was only for two planes. Just look at the tens of orders for 757 or 767 that have been cancelled!

[Question] All the same, you do suffer from the air transport crisis.

[Answer] There is no decline in traffic, just in airlines revenues. The airlines must face difficult problems when they want to buy new planes. Also, the international banking system, especially the U.S. system, has invested a lot in airlines and they are no longer perceived as a good investment.

The main culprits in the present crisis are: the U.S. deregulation policy--in other words, anybody can do as they please--which resulted in fierce competition, and the depression of the U.S. market which, alone, represents 50 percent of the world market. In practice, the consequences were that Boeing had to lay off 10-15 thousand workers, that Lockheed stopped production and that Douglas is not selling a single DC-10 any more. The unfortunate has come to the point where it is renting its DC-9 to American airlines on a monthly basis.

As for us, we are resisting better than Boeing whose major market is extremely depressed, because we operate mainly in Europe and in Asia where things are not as bad as in the United States. For instance, we have sold some 40 Airbus in 1981 and 19 so far this year, whereas Boeing has not sold a single 757 or 767 in the past 16 months! When I look at that, I am glad Airbus did not push itself too much on the U.S. market.

[Question] Some are hinting that your sales conditions are extremely generous.

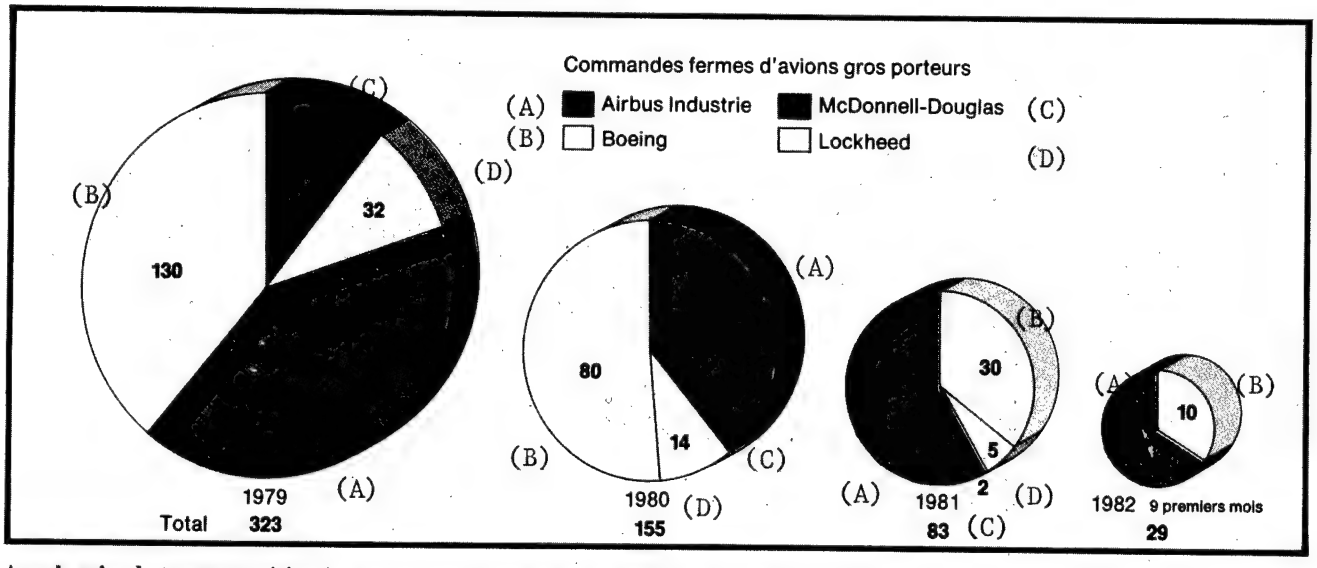
[Answer] Indeed, there is a campaign going on in the United States to explain that if Boeing cannot sell its planes--the best in the world--it is because Airbus is offering irregular financial terms. Rene Girard made it quite clear: you always need a scapegoat.

But I tell you that this accusation is wrong and I can prove it. First, let us consider public aid to research and development. This aid is not subsidies, but loans. Each time we deliver a plane, we repay 3 million dollars. In the case of the A-300, for instance, all expenses will have been covered when the 360th aircraft is sold. That goes too for the billion dollars that was spent on the A-310. Besides, that will be the only time European taxpayers get their money back.

Now let us look at sales financing. The situation is clear for those who do not try to obscure it. Over a year ago, an agreement was signed between Exim Bank and its European correspondents, such as COFACE [French Foreign Trade Insurance Company] in France, Hermes in Germany and ECGD [expansion

Jumbo Jets No Longer Sell:
Firm Orders for Jumbo Jets

Les gros porteurs ne se vendent plus



Avec la crise du transport aérien, les commandes mondiales d'avions gros porteurs se réduisent comme une peau de chagrin. Lockheed et McDonnell-Douglas ont dû abandonner la partie, tandis que Boeing et Airbus résistent tant bien que mal.

1982, first nine months

As a result of the air transport crisis, world jumbo-jet sales are shrinking away. Lockheed and McDonnell-Douglas had to give up, Boeing and Airbus manage to hold on.

unknown] in Great-Britain. This agreement applies to all financing procedures (term of the loans, interest rates, etc.) and no exception is allowed. Besides, there is some control, as our financing proposals are systematically telexed to Exim Bank. Now, the latter has never filed a complaint since the agreement came into force. Boeing is well aware of it and when they tell the contrary, it is deliberate. In fact, Boeing's objective is to get more money from Exim Bank.

Briefly, if we are doing better than Boeing, it is just that our markets are resisting and maybe also that our planes are better adapted to present-day needs.

[Question] You are selling planes, all right, but still fewer than before.

[Answer] That is true. All the same, last year we sold more planes than we produced, which means that our backlog of orders remained ahead of our production. At present, counting firm orders and options, we hover around 500 planes.

As far as our production rate is concerned, we were ready to increase it to six or even eight units per month if market conditions had required it. That was not the case. Right now, we are slightly below five units per month and our production rate keeps increasing. I did say: keeps increasing.

[Question] Yet, there are talks of layoffs.

[Answer] It is true that the manufacturers who are partners in Airbus Industrie are not hiring. There are two reasons for this. First, the 200th plane requires fewer work hours--five times fewer, that is a lot--than the first mass-produced planes. Then, all partners have other activities, especially military activities, with their own markets which are not necessarily strong.

Therefore, the Airbus is not facing a disaster. It is just that the market is not as strong as it used to be and the competition, which was fierce, has become hyperfierce. Douglas is making desperate efforts to keep its DC-9 assembly line working since there is no market left for the DC-10. And if Boeing is so aggressive, it is because it has invested 3.5 billion dollars in two new planes, the 757 and 767, which were introduced right when the market was dwindling and when our A-310 was making its breakthrough.

[Question] Have you not been overly optimistic in the past?

[Answer] Our forecasts were not optimistic. They were realistic at the time they were made. Moreover, we should not compare what is not comparable. It is true that we sold 220 planes in 1979; but, then, the A-310 had just been introduced. At the time, we even managed to sell 90 planes in 3 weeks, thanks to orders from Swissair, KLM and Lufthansa. This is not something you can do every other year! Large spectacular orders are a thing of the past. All major airlines have made their choices, either us or Boeing, and we are now dealing with companies that are often smaller and, in addition, have complex financing problems. Selling to Bangladesh is not the same as selling to Swissair!

[Question] Unsuccessful in the United States, Boeing has decided to put spokes in your wheels in Asia. How do you like that threat?

[Answer] You should not believe that Boeing had left us a clear field in Asia. They may not have been ready to go as far as they are going now, but the competition was already very strong. Anyhow, it is normal for the first manufacturer in the world to try and regain a foothold over there, all the more so as they now have a plane--the 767--which is close to the A-310. I say close to because the 310 has specific assets (cargo version, range) which enable us to sell it for 2 million dollars above Boeing's last offer.

[Question] Was Thai Airways' cancellation of its order quite regular, or was it the result of unfair maneuvering on Boeing's part?

[Answer] In questions of this type, there are two approaches, Boeing's and ours. When Boeing loses a sale, they say "Airbus is cheating and had the benefit of diplomatic pressure." As if the French Ambassador in Bangkok had more influence than his U.S. colleague! Our approach is to say: "They won. Good for them. Let us not talk about cheating."

In the case of Thai Airways, we should mention that our competitor opposed the 767 to the A-300-600 which is larger than the basic A-300 and, therefore, requires engines more powerful than the present General Electric engines. Contrary to its obligations, General Electric was unable to deliver on time the engines we needed. We then turned to Pratt & Whiney. Under "friendly" pressure from General Electric, Thai Airways then remembered that all its fleet is equipped with General Electric engines and they preferred not to have engines from another manufacturer.

Fortunately, no situation is irreversible. I remember that, a few years ago, we had obtained an order from Taiwan; finally, it was cancelled in favor of Boeing. At the time, we said nothing, we just gritted our teeth; since then, we have sold Airbus planes to Taiwan and they are flying, whereas the 767 have not even been delivered.

[Question] A gigantic duel between Airbus and Boeing is said to be about to take place on the Japanese market. What are your chances? Would it not be logical for Airbus to sell planes to make up for the cars with which the Japanese are flooding Europe?

[Answer] First remark: The Japanese also sell many cars to the United States. In this respect, the Americans have as good a right as we do to claim reciprocity. Second remark: Washington's political influence in Japan is not negligible. Third remark: the U.S. and Japanese industries are strongly interrelated since 15 percent of the 767 are manufactured in Japan. This is why the largest Japanese domestic airline, All Nippon, is buying from Boeing although if--technically speaking--there is one company in the world that should buy Airbus, it is that one. This is because the Airbus is extremely competitive on short and medium ranges, whereas the 767, with its heavier wings, becomes really interesting only beyond a certain range. Now, all of All Nippon's routes are in the range favorable to us.

This being said, we are negotiating with Japan Airlines for the replacement of two dozens of DC-8 and, as far as negotiations are concerned, we are even with the Americans.

[Question] In such negotiations, we have the impression that political questions are at least as important as the characteristics of the product. Is that really so?

[Answer] Your impression is exaggerated. Actually, three levels of decision are involved when an airline purchases an aircraft. First, the technical level. Commercial managers, technical managers and pilots evaluate the competing aircraft; then, they go their general management and say: "We prefer that one." Then, the strategic level. The general management makes its decision on the basis of considerations such as fleet homogeneity or, on the contrary, fleet diversification, as certain companies do not want to be too closely connected to a single manufacturer. In passing, I would like to point out that this desire to diversify played in our favor when Boeing was present everywhere, and that it might start playing in the other direction since some companies may find they have too many Airbus and go elsewhere. On the last level, there is government policy, especially in countries where airlines are under public control. Government interventions of this type do exist, but are much less frequent than is generally assumed.

[Question] Is not Latin America, for instance, the preserve of the United States?

[Answer] Until now, we have really fought, and with success, only in Brazil since we signed agreements with the three major companies, first Cruzeiro, then Varig, and now Vasp, to which we are soon going to deliver its first A-300 and with which we have signed another sales agreement for the A-310. Have there been American pressures? I do not know. At any rate, you cannot talk of a preserve.

[Question] What about the Gulf?

[Answer] There again, the Americans were not much of a problem since we signed in particular a 1-billion dollar contract with Kuwait and another 1-billion dollar contract with Saudi Arabia. And both paid cash!

[Question] Is not the air transport crisis less hard to bear, financially speaking, for a long-established enterprise like Boeing than for a group like yours, which started from scratch and is still operating in the red?

[Answer] It all depends on what you call "still operating in the red." In the past two or three years, we have earned money on the agreements we have signed. That was not the case before since in all mass-production, at Airbus like at Boeing, the first units cost a lot and are sold cheap to gain a foothold on the market. All manufacturers suffer very high losses on the first 130 or 150 units they sell. Profits are made--that is logical--only when sales prices (which keep increasing) exceed production cost (which keep decreasing). We have reached that threshold.

[Question] But, overall, the Airbus operations shows a deficit.

[Answer] It will until the 750th Airbus is delivered, i.e. in several years from now. It takes about 10 years to make money on a plane.

It is true that Boeing does not have such problems: when it loses money on the 767, it makes it up on the 747 or on the 727 which are way beyond their profitability thresholds. We have no such cash cows yet; this is one of the reasons why we want to expand our line.

Boeing has another advantage: a very high productivity level, precisely because it has a very broad line which enables it, for instance, to shift similar parts from one aircraft to another.

Now more than ever, competition takes place at production cost level. You cannot compete with someone who controls 60 percent of the market if you hold only 10 percent. But as soon as you are half the size of your major competitor, you can hold on to your ground.

In this respect, I would like to point out that, at the time of the Caravelle, the higher U.S. productivity was compensated by the fact that French labor would cost 30-35 percent less. This is no longer true today; the situation has even reversed itself if you include social security contributions.

[Question] Boeing is expecting a firming of the market. What about you?

[Answer] Me too, in two years from now maybe. Actually, it depends to a large extent on economic recovery and on the agreements airlines will sign with one another to return to reasonable tariffs. Then, they will find money to invest. The most important factors in a resumption of sales are the interest rate and the price of oil. When interest rates are high and oil is cheap, the airlines are better off making do with their old fleet. When the reverse is true, their interest is to buy modern airplanes.

[Question] Seven francs to the dollar, is that good for you?

[Answer] All good! Practically, all our sales agreements are in dollars, except for a few which are based on a group of currencies (French franc, deutschemark, pound sterling and of course the dollar). We are the only enterprise ruled by French laws that is authorized to keep its accounts in dollars. As soon as we receive dollars from our customers, we pass them on to our partners. Now, four years ago, when I gave one dollar to Gen Jacques Mitterrand, chairman of Aerospatiale, he would get 4.50 francs for it; today, he gets 7 francs. I know that in the meanwhile inflation has been devastating, but not in the same proportion.

[Question] And for Boeing, is it a hard blow?

[Answer] For Boeing, it does not make any difference since its costs are in dollars, its receipts are in dollars and its competitors' receipts are also in dollars.

[Question] It has often been said that, in such programs, cooperation is the last resort solution. In the case of the Airbus, it seems to be a success. Why?

[Answer] Indeed, cooperation programs have a bad name because most of them turned out to be failures. They are managed by committees and all parties involved are expected to agree. That results in costly delays and unsatisfactory compromises. At Airbus, there is a central organization--Airbus Industrie--which makes all decisions itself. We have convinced our partners that our true problem was to organize ourselves to face competition so as to be as flexible and quick as our U.S. competitors.

Cooperation offers technical advantages in that when you bring a British school, a German school and a French school together under the leadership of a single decision-maker--not a committee--you always get results. Let me give you an example. Remember the DC-10 disaster in Ermenonville. A door had not been closed properly and that caused a sudden explosive depressurization in the hold, the floor of the aircraft collapsed, destroying the control system. On our planes, this type of accident is unthinkable. First, the door is "idiotproof," which means that any idiot can close it. Then, the floor is reinforced. Finally, even if the floor collapses, the control system goes on working because it is a rational dual system: one control goes through the floor, the other through the ceiling. All these improvements are the result of cooperation, for they were imagined at a meeting of chief engineers; one of them, although it was not his specialty, drew the attention of our technical manager to these problems.

Another advantage: although we cannot demand of a partner that he bring us orders from his national airline (besides, that would be contrary to GATT regulations), the fact that a manufacturer in a given country is a partner in our enterprise cannot leave the authorities in his country indifferent. This is what I just meant when I was talking about Japan and Boeing.

Finally, cooperation enables us to spread expenditures. Right now, as far as future aircraft are concerned, we have a choice between the A-320, the TA-9, which is an elongated Airbus, and a long-haul aircraft. We are going to do all three, but not at the same time; we cannot afford it. Which one should we start with? If manufacturers interested in the A-310 join Airbus Industrie, the present partners could devote part of their financial and human potential to the other two projects.

Believe me, I have been here for seven years and I still am an ardent supporter of cooperation, provided of course that its approach is commercial and not political. Here, we have an enterprising spirit and no career to protect.

[Question] In other words, times are hard but you are not unhappy.

[Answer] I am happy today as I was happy yesterday; but it is harder to be happy today.

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CSO: 3698/104

DORNIER: CARBON-FIBER COMPOSITE AIRCRAFT STRUCTURES

Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German
25 Nov 82 p 7

/Unattributed Article/

/Text/ Composite materials, especially with carbon fibers, today are an essential precondition for future modes of aircraft construction. The specific applications of carbon-fiber composite materials permit weight savings of about 15 percent in the primary structure of aircraft. This facilitates the construction of smaller aircraft with favorable payloads. The German air and space enterprise Dornier, in its Munich-Neuaubing plant, is now mass-producing over 1,000 airbrakes by the end of October 1982, to be installed in the German-French ground-combat and training aircraft Alpha Jet. These parts are being manufactured in the carbon-fiber plastic composite construction mode. The Alpha Jet airbrake is thus supposed to be the mass-produced aircraft component made of carbon-fiber plastic (CFK) with the largest production in the world, according to Dornier.

Dornier began the development of this CFK component in 1971. Besides weight reduction, "low risk" was another important design criterion. Within the framework of the program of the Federal Ministry of Defense, future air technology (ZTL) as well as the air-travel components testing program (KEL), the first carbon airbrakes were already tested on the Alpha Jet prototype 03 beginning in June 1974. Compared to the conventional metal version, the carbon-fiber plastic design was supposed to achieve a weight reduction of 25 percent. On the basis of positive ground and flight tests, the Alpha Jet airbrake was taken over as the first CFK component in European aircraft construction, to be mass-produced. Mass production in the Dornier plant in Munic-Neuaubing is in progress since 1976. The first mass-produced pair of airbrakes was manufactured in March 1977.

In collaboration with the German Air Force, a long-term testing program has been underway, using 18 CFK airbrakes on the Alpha Jet. The intention is to observe their behavior over a time interval up to 10 years. On nine aircraft in three use associations, these airbrakes are subjected to inspections at regular intervals, very careful inspections, extending beyond the usual norm. The objective here is to gather information concerning the long-term operating behavior of the carbon-fiber composite material. The results will point the

direction for the design of future CFK aircraft structures. Besides the currently used Alpha Jet airbrake, Dornier is already developing, building, and testing a series of other aircraft subassemblies that are fabricated by the CFK composite construction mode, for example rudders and tailfins as well as the complete wing and spar box of the Alpha Jet. Furthermore, CFK will also be used for a number of components of the new, mass-produced multipurpose and feeder aircraft of the type Dornier 228.

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